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EOSDIS Core System Project

ECS Training Material Volume 2A: Introduction and Detailed System Overview: Science Data Processing Internal Training

July 1999

Raytheon Systems Company
Upper Marlboro, Maryland

ECS Project Training Material
Volume 2A: Introduction and Detailed System Overview: Science Data Processing Internal Training

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Preface

This document is a contract deliverable with an approval code of 3. As such, it does not require formal Government approval. This document is delivered for information only, but is subject to approval as meeting contractual requirements.

Any questions should be addressed to:

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Abstract

This is Volume 2A of a series of lessons containing the training material for Release 5A of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS). This lesson provides an introduction and detailed system overview of ECS Release 5A design and internal interfaces.

Keywords: training, course objective, Earth Science Enterprise, Release 5A, Science Data Processing, Internal Training

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Change Information Page

List of Effective Pages	
Page Number	**Issue**
Title	Original
iii through x	Original
1 through 12	Original
Slide Presentation 1 through 219	Original

Document History			
Document Number	**Status/Issue**	**Publication Date**	**CCR Number**
625-CD-520-001	Original	July 1999	

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Contents

Summary of the Lesson Presentation

Slide Presentation

Introduction

Identification

Training Material Volume 2A is part of Contract Data Requirements List (CDRL) Item 129, whose requirements are specified in Data Item Description (DID) 625/OP3 and is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

Scope

Training Material Volume 2A provides an introduction and detailed system overview of ECS Release 5A design and internal interfaces. It summarizes materials presented in a dynamic, animated visual presentation, and includes a copy of the visuals. The instruction briefly addresses the program context of ECS within NASA's Earth Science Enterprise, introduces the systems that make up ECS at a site, describes each subsystem and its Computer Software Configuration Items (CSCIs), including system elements and interfaces, and then describes system functioning in the context of operational scenarios. This lesson is designed to provide the operations staff with sufficient knowledge and information to satisfy all lesson objectives.

Purpose

The purpose of this Student Guide is to provide a summary and copy of the visuals for a detailed course of instruction that forms the basis for understanding ECS overall structure and function. Lesson objectives are developed and will be used to guide the flow of instruction for this lesson. The lesson objectives will serve as the basis for verifying that all lesson topics are contained within this Student Guide and slide presentation material.

Status and Schedule

This lesson module provides detailed information about training for Release 5A. Subsequent revisions will be submitted as needed.

Organization

This document is organized as follows:

Introduction:	The Introduction presents the document identification, scope, purpose, and organization.
Related Documentation:	Related Documentation identifies parent, applicable and information documents associated with this document.

Student Guide:	The Student Guide summarizes the core elements of this lesson. All Lesson Objectives and associated topics are included.
Slide Presentation:	Slide Presentation is reserved for slides used by the instructor during the presentation of this lesson.

Related Documentation

Parent Document

The parent document is the document from which this ECS Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work

Applicable Documents

The following documents are referenced within this ECS Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

535-TIP-CPT-001	Goddard Space Flight Center, Mission Operations and Data Systems Directorate (MO&DSD) Technical Information Program Networks Technical Training Facility, Contractor-Provided Training Specification
609-CD-500	Release 5A Operations Tools Manual
611-CD-500	Release 5A Mission Operation Procedures for the ECS Project

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

220-TP-001	Operations Scenarios - ECS Release B.0 Impacts

305-CD-020	Release B SDPS/CSMS System Design Specification Overview for the ECS Project
305-CD-021	Release B SDPS Client Subsystem Design Specification for the ECS Project
305-CD-022	Release B SDPS Interoperability Subsystem Design Specification for the ECS Project
305-CD-023	Release B SDPS Data Management Subsystem Design Specification for the ECS Project
305-CD-024	Release B SDPS Data Server Subsystem Design Specification for the ECS Project
305-CD-025	Release B SDPS Ingest Subsystem Design Specification [for the ECS Project
305-CD-026	Release B SDPS Planning Subsystem Design Specification for the ECS Project
305-CD-027	Release B SDPS Data Processing Subsystem Design Specification for the ECS Project
305-CD-028	Release B CSMS Communications Subsystem Design Specification for the ECS Project
305-CD-029	Release B CSMS System Management Subsystem Design Specification for the ECS Project
305-CD-030	Release B GSFC DAAC Design Specification for the ECS Project
305-CD-031	Release B Langley DAAC Design Specification for the ECS Project
305-CD-033	Release B EDC DAAC Design Specification for the ECS Project
305-CD-034	Release B ASF DAAC Design Specification for the ECS Project
305-CD-035	Release B NSIDC DAAC Design Specification for the ECS Project
305-CD-036	Release B JPL PO.DAAC Design Specification for the ECS Project
305-CD-037	Release B ORNL DAAC Design Specification for the ECS Project
305-CD-038	Release B System Monitoring and Coordination Center Design Specification for the ECS Project
305-CD-039	Release B Data Dictionary Subsystem Design Specification for the ECS Project
305-CD-500	Release 5A Segment/Design Specification for the ECS Project

313-CD-500	Release 5A ECS Internal Interface Control Document for the ECS Project
601-CD-001	Maintenance and Operations Management Plan for the ECS Project
604-CD-001	Operations Concept for the ECS Project: Part 1-- ECS Overview
604-CD-002	Operations Concept for the ECS Project: Part 2B -- ECS Release B
605-CD-002	Release B SDPS/CSMS Operations Scenarios for the ECS Project
607-CD-001	ECS Maintenance and Operations Position Descriptions
500-1002	Goddard Space Flight Center, Network and Mission Operations Support (NMOS) Certification Program, 1/90

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Introduction and Detailed System Overview: Science Data Processing Internal Training

Lesson Overview

This lesson provides a brief illustration of the place of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) within NASA's Earth Science Enterprise, introduces the subsystems that make up ECS at a site, examines each subsystem and its computer software configuration items, including system elements and interfaces, and describes system function in the context of operational scenarios.

Lesson Objectives

Overall Objective - The overall objective of this lesson is to become able to describe ECS structure and function for Science Data Processing (SDP). The lesson is a dynamic, animated visual presentation illustrating subsystems, their components and interfaces, and their functions and interrelationships in the context of operations. It is not a complete description of all ECS structure and functioning, and it does not include full descriptions of specific entities in the ECS overall program (e.g., System Monitoring and Coordination Center). It is not a software development lesson and does not include an exhaustive description of ECS interfaces and event sequences. It includes no hands-on exercises, and is not intended as operator training.

Specific Objective 1 - The student will identify ECS subsystems and their computer software configuration items (CSCIs).

Condition - The student will be given a copy of document 305-CD-500-001 *Release 5A Segment/Design Specification for the ECS Project*.

Standard - The student will list 10 subsystems and specify the CSCIs that make up nine of the 10 subsystems.

Specific Objective 2 - The student will specify for each CSCI the major components and the major functions or processes for which each component is responsible.

Condition - The student will be given a copy of document 305-CD-500-001 *Release 5A Segment/Design Specification for the ECS Project*.

Standard - The student will correctly identify the major components and their functions for the CSCIs, as listed in document 305-CD-500-001 *Release 5A Segment/Design Specification for the ECS Project.*

Specific Objective 3 - The student will describe the role of ECS CSCIs and their functions or processes in the context of ECS operational scenarios.

Condition - The student will be given a copy of document 313-CD-500-001 *Release 5A ECS Internal Interface Control Document for the ECS Project*.

Standard - The student will summarize the role of the relevant ECS CSCIs and their components in selected ECS operations, including ASTER Data Acquisition Requests and expedited data support, production and distribution of data products, update of quality assurance metadata, on-demand processing, user registration, and Landsat data insertion and access.

Importance

Knowledge of overall ECS structure and function, and ability to locate and use relevant information in documents 305-CD-500-001 and 313-CD-500-001, can provide helpful context for conducting ECS operations and maintenance. This lesson provides the necessary overview, and an efficient summary and guide for reviewing and using the information in the documents.

Summary of the Lesson Presentation

This lesson is composed of a dynamic, animated visual presentation. It is divided into several segments.

Program Overview

The main content of the lesson begins with an overview of the place of ECS in NASA's Earth Science Enterprise, part of the U.S. Global Change Research Program. Slides 4 - 7 address this overview.

Subsystems and Functions

The lesson provides a context diagram illustrating interrelationships among ECS subsystems, and then introduces and examines each subsystem (slides 8 - 11). For each subsystem, the lesson presents major functions, CSCIs and components, and major interfaces among components, CSCIs, and other subsystems. Subsystems addressed include:

- Data Server (DSS): Slides 12 - 20.
- Ingest (INS): Slides 21 - 25.
- Client (CLS): Slides 26 - 30.
- Data Management (DMS): Slides 31 - 38.
- Interoperability (IOS): Slides 39 - 43.
- Planning (PLS): Slides 44 - 47.
- Data Processing (DPS): Slides 48 - 56.
- System Management Support (MSS): Slides 57 - 66.
- Communications (CSS): Slides 67 - 72.
- Internetworking (ISS): Not addressed in detail in this lesson.

ECS Operational Functioning

ECS operational functioning, introduced in slides 73 and 74, is addressed using selected scenarios. The source material in *Release 5A ECS Internal Interface Control Document for the ECS Project*, document 313-CD-500-001, contains additional scenarios, but the ones selected for this lesson illustrate system functioning and the major roles of the subsystems, CSCIs, and components. The animated presentation for this part of the lesson consists of several series of clusters of three visual displays. In each cluster, the first display introduces a step or function at a conceptual level. The second display shows interactions at the subsystem level. The third display shows interactions at the CSCI and component level.

ASTER Data Acquisition Request (DAR) Support

The DAR support scenario, introduced in slide 75, illustrates ECS functioning for DAR submission, Data Subscription, Data Insertion, and Data Notification. Slides 76 - 97 present this scenario.

ASTER Data Production and Chaining

The chaining scenario illustrates Product Subscription, On-demand Production, Standing Order Delivery, and Quality Assurance Update. Slides 98 - 150 present this scenario.

ASTER Expedited Data

The ASTER expedited data scenario illustrates Data Subscription, Data Insertion, and Data Notification. Slides 151 - 163 present this scenario.

User Registration

The user registration scenario is taken from illustrations of Landsat operations, introduced in Slide 164. Although it is not tied to Landsat, it was presented in that context in document 313-CD-006-007. Slides 165 - 173 present this scenario.

Landsat Processing System (LPS) Data Insertion

The LPS data insertion scenario illustrates Level 0 (L0R) data insertion, including Automated Ingest and archiving of subinterval, scene, and browse data. Slides 174 - 192 present this scenario.

Landsat Data Access

The Landsat data access scenario illustrates search and order of browse data and scene data. It also illustrates data distribution by 8-mm tape and ftp pull. Slides 193 - 217 present this scenario.

Summary and References

The lesson concludes with a brief summary (slide 218) and identification of references (slide 219). As noted previously, the references are documents 305-CD-500-001 and 313-CD-500-001.

Slide Presentation

Slide Presentation Description

The following slide presentation represents the slides used by the instructor during the conduct of this lesson.

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